

X(4660) $I^G(J^{PC}) = ?^?(1^{--})$

Seen in radiative return from $e^+ e^-$ collisions at $\sqrt{s} = 9.54\text{--}10.58$ GeV by WANG 07D. Also obtained in a combined fit of WANG 07D and AUBERT 07S. See also the review under the $X(3872)$ particle listings. (See the index for the page number.)

X(4660) MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
4664±11±5	WANG 07D	BELL	$10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •			

$4661^{+9}_{-8} \pm 6$ ¹ LIU 08H RVUE $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$

¹ From a combined fit of AUBERT 07S and WANG 07D data with two resonances.

NODE=M189

NODE=M189M

NODE=M189M

NODE=M189M;LINKAGE=LI

NODE=M189W

NODE=M189W

NODE=M189W;LINKAGE=LI

NODE=M189215;NODE=M189

DESIG=1

DESIG=2;OUR EVAL;→ UNCHECKED ← DESIG=3

NODE=M189230

NODE=M189G1
NODE=M189G1

OCCUR=2

OCCUR=2

NODE=M189G1;LINKAGE=LI
NODE=M189G1;LINKAGE=LU
NODE=M189G1;LINKAGE=WA
NODE=M189G1;LINKAGE=WN

NODE=M189225

NODE=M189R01
NODE=M189R01NODE=M189R02
NODE=M189R02

NODE=M189R02;LINKAGE=PA

NODE=M189

REFID=53143
REFID=52296
REFID=51724
REFID=51959**X(4660) WIDTH**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
48±15±3	WANG 07D	BELL	$10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •			

$42^{+17}_{-12} \pm 6$ ² LIU 08H RVUE $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$

² From a combined fit of AUBERT 07S and WANG 07D data with two resonances.

X(4660) DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 e^+ e^-$	
$\Gamma_2 \psi(2S)\pi^+\pi^-$	seen
$\Gamma_3 D^0 D^{*-} \pi^+$	

X(4660) $\Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$

$\Gamma(\psi(2S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$	$\Gamma_2\Gamma_1/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •	
$2.2^{+0.7}_{-0.6}$ ³ LIU 08H RVUE $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$	
5.9 ± 1.6 ⁴ LIU 08H RVUE $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$	
$3.0 \pm 0.9 \pm 0.3$ ⁵ WANG 07D BELL $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$	
$7.6 \pm 1.8 \pm 0.8$ ⁶ WANG 07D BELL $10.58 e^+ e^- \rightarrow \psi(2S)\pi^+\pi^-\gamma$	

³ Solution I in a combined fit of AUBERT 07S and WANG 07D data with two resonances.

⁴ Solution II in a combined fit of AUBERT 07S and WANG 07D data with two resonances.

⁵ Solution I of two equivalent solutions in a fit using two interfering resonances.

⁶ Solution II of two equivalent solutions in a fit using two interfering resonances.

X(4660) BRANCHING RATIOS

$\Gamma(D^0 D^{*-} \pi^+)/\Gamma(\psi(2S)\pi^+\pi^-)$	Γ_3/Γ_2
<10 90 PAKHLOVA 09 BELL $e^+ e^- \rightarrow X(4660) \rightarrow D^0 D^{*-} \pi^+$	

$\Gamma(D^0 D^{*-} \pi^+)/\Gamma_{\text{total}} \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma \times \Gamma_1/\Gamma$
$<0.37 \times 10^{-6}$ 90 ⁷ PAKHLOVA 09 BELL $e^+ e^- \rightarrow X(4660) \rightarrow D^0 D^{*-} \pi^+$	

⁷ Using $4664 \pm 11 \pm 5$ MeV for the mass of $X(4660)$.

X(4660) REFERENCES

PAKHLOVA 09 PR D80 091101	G. Pakhlova <i>et al.</i>	(BELLE Collab.)
LIU 08H PR D78 104032	Z.Q. Liu, X.S. Qin, C.Z. Yuan	
AUBERT 07S PRL 98 212001	B. Aubert <i>et al.</i>	(BABAR Collab.)
WANG 07D PRL 99 142002	X.L. Wang <i>et al.</i>	(BELLE Collab.)